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Editorials

COLONIAL VETERINARY SCHOLARSHIPS.

At last the good news has come through that the recommendations made by Lord Lovat's Committee have commenced to bear fruit. It will be remembered that this Committee was appointed by Mr. Amery, when Secretary of State for the Colonies, to inquire into the condition of things existing in the non-self-governing Dependencies in regard to the facilities for Veterinary Research and Administration.

The Report was issued at the commencement of 1929 and one of the recommendations was for the establishment of a scheme of post-graduate scholarships, intended to provide this branch of the Colonial Service with a supply of candidates who had received a thorough preparation for the work lying before them.

Reference to the Report* shows that, besides encouraging men who had already embarked on veterinary training to develop further the scientific side of their education, it was proposed to attract to veterinary science men who had already graduated in general science and shown a bent for scientific work. But quite apart from his training it is certain that satisfactory results cannot be achieved by a Colonial Veterinary Officer unless he possesses a personality such as will command the respect both of white settlers and of the indigenous peoples.

Assurances have now been received that the necessary funds will be provided to enable a scholarship scheme to be brought into operation, and from 1930 onwards the Secretary of State will be in a position to award up to 10 scholarships annually, each of the value of £250 per annum.

The recon.mendations of the Committee in regard to qualifications

* *Colonial Veterinary Service.* Report of a Committee appointed by the Secretary of State for the Colonies. Published by H.M. Stationery Office, 1929. Price 9d. nett.

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of the candidates and the courses of training which would ordinarily be appropriate will be regarded as guiding principles, but the case of each candidate will be considered on its merits and the duration and character of the training of the selected candidates will be regulated accordingly. No guarantee can be given that the holders of scholarships will afterwards receive appointments in the Colonial Services but it is anticipated that scholars will usually receive such appointment, provided that their work, conduct, and progress, have been satisfactory.

The closing date for the receipt of applications will be June the 15th. Applications should, however, preferably be submitted before the end of May.

Further details are given on pages 64 to 67 of this issue and the full Report can be obtained through any bookseller or direct from H.M. Stationery Office, Adastral House, Kingsway, London, W.C.2.

To all students, and to recent graduates, who have Colonial aspirations, we strongly commend careful perusal and consideration of these publications.

THE JEWISH METHOD OF SLAUGHTER OF CATTLE FOR FOOD.

In the Veterinary Journal for September, 1927, we published an illustrated article on the Weinberg Pen, an apparatus designed to obviate the method commonly adopted for placing cattle, intended for slaughter by the Jewish method, in the position necessary by the ritual for the administration of the throat cut by the knife of the Shochet.

Since then a Committee has been formed to deal with the question, and in the columns of the present issue will be found a report of a recent meeting by which it will be seen that the principle of the pen has been approved, the following being the wording of the resolution :

> " That this Committee is satisfied that the Weinberg Machine, as demonstrated both by the durability test and the final trial held to-day, fulfils the objects for which it is designed ; and constitutes a great improvement from a humane standpoint on existing methods of casting animals for Shecheta ; and recommends its adoption in place of present methods."

This has been forwarded to the Jewish Shecheta Board, who are taking action to utilise this system instead of the present method of securing and casting.

Briefly the Weinberg Pen consists of a strong covered stall, amply padded inside, large enough for cattle of any size, but easily adjusted so as to accommodate large or small ones. It revolves within two large iron rings, one at each end of the stall, and by operating a lever is made to turn half a revolution, so that the animal is laid quickly and

gently on its back, resting on the well-padded top of the pen. No pain attends the process and the animal hardly has time to realise what is happening before its throat is cut. Its neck automatically gets into the right position for the cut resting on a low platform, whilst an attendant steadies the head with his hands.

The whole operation of turning the animal on its back in the pen and cutting its throat averages about 20 to 30 seconds.

In the case of perfectly quiet animals the use of the pen reduces the time taken in casting and getting the animal into position for the cut by more than half as compared with the quickest of the existing methods, and by very much more than half as compared with other existing methods ; whilst it abolishes the pain attending any of them. But the outstanding merit of the pen is that vigorous and restless animals which, under the existing methods, might have to undergo long minutes of suffering and terror, often attended by severe injuries, are by its use cast and brought into the required position for the cut with the same rapidity and freedom from pain as the quiet ones.

It is the veterinary profession whose decision should always be asked on subjects such as this ; and the expert evidence as to whether the machine adds to, or takes away from, cruelty to animals, should always be given by the veterinarian ; who, by his training, is by far the best man to judge.

DOG DISTEMPER AND IMMUNISATION.

By the courtesy of the author, and by permission of the Editor of *Nature*, we are able to republish an interesting and illuminating article on the above subject from the pen of Dr. Laidlaw, F.R.S., the distinguished scientist whose bacteriological research, combined with the clinical work of the Veterinary Superintendent of the Medical Research Council, Major Dunkin, M.R.C.V.S., D.V.H., is responsible for the method of immunisation which is at the present time being given an extensive trial amongst the dogs of Great Britain, Germany, and America.

As Dr. Laidlaw says, " It is not possible to pass any *final* judgment on the method at the present time," and " It is also necessary to remember that the immunisation against the virus disease is no guarantee against infection by bacteria which may cause bronchitis, pneumonia, gastro-enteritis, and so on ; but immunisation should diminish the incidence of these diseases."

That the latter may prove, upon extended trial in the field, to be the case in regard to the complications which so often follow fatally in the footsteps of an original attack of distemper, is the heartfelt wish of every dog owner and every veterinary surgeon whose *clientèle* entitles him to esteem himself a canine practitioner.

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General Articles

DOG DISTEMPER AND IMMUNISATION.*

By P. P. LAIDLAW, F.R.S.

SOME seven years ago the *Field* Distemper Fund was inaugurated with the object of encouraging the study of dog distemper, in the hope that the ravages of this disorder might be mitigated through the discovery of some preventive measure or some satisfactory method of treatment. The *Field* Distemper Council, which body administers the *Field* Distemper Fund, joined forces with the Medical Research Council for the purpose of this study, and a scientific committee, composed of veterinary and medical men, was formed to supervise the research work. The Medical Research Council is interested in dog distemper as it is an example of an acute infectious fever, comparable in many respects to such diseases as influenza or measles in man, and it was hoped that the study of the canine fever would ultimately lead to a better understanding of such infectious fevers in man.

The highly infectious nature of distemper rendered the study somewhat difficult, for it was necessary to take elaborate precautions throughout the investigation in order to guard against accidental spread of the disease. New buildings were constructed for the work and dogs were bred, in the strictest possible isolation, for the purposes of experiment. Progress was thus inevitably slow, but it is now clear that without the special equipment and in the absence of the rigid precautions against accidental infection, it is highly probable that little progress would have been made.

The demonstration of the fact that ferrets were very susceptible to dog distemper was of great assistance to the work, for it was found to be possible to experiment in the first instance with this species, which is relatively easy to maintain in close confinement and strict isolation, and reserve the specially bred dogs for crucial experiments. The facts disclosed in the study of the disease in ferrets have been shown to be applicable to the disease in dogs with only minor modifications.

At the time the work for the *Field* Fund was commenced, the nature of the infectious agent in dog distemper was not firmly established. Carré, in 1905, came to the conclusion that the disease was caused by a filterable virus. He quoted experiments to show that the contagium would pass through the pores of filters specially designed to hold back

* Reprinted from "Nature," Vol. 124, No. 3139, by the courtesy of the Editor, and the Author.

all ordinary bacteria, and he found that the disease could be transmitted with material in which no structures resembling bacteria could be detected under the microscope and from which no bacterial cultures could be secured. Carré's view did not meet with general acceptance, and from time to time various visible bacteria, which were regarded as causal organisms, were secured from distemper cases. That infection with ordinary bacteria did occur very frequently in distemper cases was undoubted, but it was by no means clear which of the several bacteria recovered from diseased animals should be regarded as the primary cause of the disorder and which the secondary, or if, under the view put forward by Carré, all the visible bacteria were really secondary infective agents and the true contagium was an ultramicroscopic virus.

The workers for the *Field* Fund confirmed Carré's findings in all essential particulars and showed that the disease could be transmitted at will, by the blood and tissues of distemper cases through an indefinite series of animals. The infective material appeared to be sterile in all the usual laboratory culture media and no bacteria could be demonstrated by microscopic examination. Further, the infective principle was shown to pass through bacterial filters of standard type and proven quality. It thus seems established that dog distemper is primarily a virus disease and that all the bacteria which can be recovered from distemper cases are really secondary invaders of damaged tissue. It was further obvious that preventive measures should be directed against the virus infection in the hope that, if this could be eliminated, the secondary invading organisms would be deprived of their aggressive ally and rendered almost, if not quite, impotent.

It was found that distemper virus could be inactivated or killed in a number of different ways and that, provided the treatment to which the virus was submitted was not too drastic, the inactivated virus formed an efficient vaccine. That is to say, a large dose of inactivated virus could be injected into an animal with complete impunity and, after the lapse of some days, the recipient of the vaccine developed a resistance to injections of fresh living virus. Supplies of virus cannot be secured by artificial culture methods, as is the case with ordinary bacteria, and recourse was therefore made to the tissues of distemper animals as a source of crude virus. The lymph glands, spleen, and liver of distemper animals nearly always have a high virus content and they can be converted into an efficient vaccine, without much difficulty, by means of small doses of formaldehyde. It was found to be possible to immunise more than 90 per cent. of ferrets by giving them a single injection of vaccine made from distemper ferret tissue. Similarly, it was found to be possible to render dogs resistant by means of a single dose of vaccine made from tissues of a distemper dog. The resistant

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state which develops in a dog or ferret after the injection of vaccine is converted into a solid and durable immunity by the injection of living virus. Animals so treated have been given massive doses of distemper virus and they remained unaffected; they have been deliberately placed in contact with severe cases of natural distemper, complicated by secondary infections and without complications, and they have not developed the disease.

After the method had been shown to be almost uniformly successful under experimental conditions, the method was extended to the field and several hundreds of foxhounds and other breeds of dogs were first vaccinated and then given a small dose of living virus. It was hoped that this procedure would give as solid and as durable an immunity as that which follows a recovery from the natural disorder and yet be comparatively free from risks. It was realised that the injection of living virus could never be made absolutely safe, but the immunity which follows recovery from the natural infection, however mild, is so firm and so durable that a final dose of living virus should guarantee real immunity in the vast majority of instances. The resistance set up by vaccine alone, though very definite and significant, was scarcely great enough to be called immunity, and it was doubtful if it would, by itself, render a dog immune for life. The results of this extended field trial were satisfactory in that the great majority of the hounds and dogs came through the immunisation process with no trouble and afterwards proved to be immune to epizootic distemper, which caused severe illness and even death in their unvaccinated companions. In a small percentage of cases the living virus caused a severe reaction in the vaccinated dog, but this was usually of short duration and was followed by complete recovery. In less than one per cent. of cases death followed the administration of the virus. The production of the prophylactic has now been undertaken by a commercial firm in Great Britain and by another in the United States of America, and several thousand doses have been issued.

It is not possible to pass any final judgment on the method at the present time. It is clear that the use of living virus carries with it some risk, for its inoculation causes, even in the vaccinated dog, a considerable strain on bodily health, and unless the recipient is free from all forms of infection grave harm may ensue. It is also necessary to remember that the immunisation against the virus disease is no guarantee against infection by bacteria, which may cause bronchitis, pneumonia, gastro-enteritis, and so on, but on the other hand, immunisation should diminish the incidence of these diseases, for it seems clear that the virus frequently weakens the dog's resistance and thus assists bacterial invasion. Immunisation should prevent, in large

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measure, the epizootic disease which causes such heavy losses year by year in the canine population.

It may be noted here that this vaccination against distemper is merely a special case of protection against a virus disease by means of inactivated or dead virus. Very similar results have been recorded recently in other diseases such as rabies, rinderpest, fowl plague, and foot-and-mouth disease. In the case of foot-and-mouth disease the matter is complex, for it is now clear that there are at least three strains of virus causing this disorder, and immunity to one strain does not carry with it immunity to either of the others. So far as information goes, there appears to be only one strain of distemper virus, and a dog or ferret which is solidly immune to a virus from one source is immune to strains from other sources.

The study of distemper has not so far proved illuminating as regards the infectious fevers of man. Vaccines made from homologous tissues are clearly not available in the case of man, and yet the hope is raised that if only artificial cultures could be secured, we might make from them vaccines which would do much to minimise the disharmonies produced by the infectious fevers.

OBSERVATIONS ON AN OUTBREAK OF EQUINE SURRA, WITH SPECIAL REFERENCE TO THE QUESTION OF VECTORS, AND TO MEASURES FOR CONTROL.

By MAJOR H. ALLEN, O.B.E., R.A.V.C.,
Remount Depot, Mona, Punjab, India.

1. Introduction.

It is not often that the veterinary worker is called upon to deal with a veritable outbreak of equine Surra, although as is well known, in its enzootic form the disease constitutes a morbid entity which ranks fairly high amongst the scourges that beset domesticated animals in India.

The circumstances attending a localised outbreak of Surra are worthy of especial study inasmuch as they afford ready means for correlating sets of ecological factors calculated to throw light upon the possible nature of the vectors concerned in the transmission of the disease, and when, therefore, an outbreak of Surra occurred in the depot in his charge, the writer at once set about keeping a careful record of not only the progress of the disease from day to day, but also of such

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factors as were deemed of value in investigating the genesis of the outbreak.

2. Geographical Disposition of Mona Charge.

The depot is constructed on the block system and contains four main charges, all of which are two to three miles apart and are fully maintained in every respect. Mona Charge, in which the outbreak occurred, is situated at the extreme northern corner of the depot. The paddock area of the Charge, which is triangular in shape, is bounded at the base by the depot land ; on one side by the Lower Jhelum Canal and a dense jungle ; on the other side by the Mona " distributory," which are Government allotments. Mona village itself, which is a Surra infected tract, is situated at the apex of the triangle. A considerable extent of the outlying country from Mona village and beyond the " distributory " is water-logged. The land at Mona Charge is low lying and has a decided incline towards the Lower Jhelum Canal boundary. The paddock is in parts not well drained and the sub-soil varies from 12-20 feet. The Veterinary Hospital of this Charge is bounded on two sides by heavily wooded jungle and dense undergrowth, and is situated on a low-lying land, the surrounding areas draining towards it. The conditions obtaining at this part of the depot are extraordinarily favourable to waterlogging(1).

3. Past History.

Mona Village and a considerable surrounding area on the other side of the Mona distributory became properly water-logged towards the end of 1924, and this led to an extension and linking up of the Surra belt(2).

The " Surra zone " commences about 39 miles from Mona Charge at the Lower Jhelum Canal Head and circles Mona Charge in the direction of the water-logged areas extending into Khushab in Shahpur District, situated at a distance of twenty-five miles from Mona.

In 1925, Surra was severe in the neighbourhood, but at this time very few animals were located in Mona Charge. The Charge remained unoccupied during 1926 but was brought into use again and expanded to its present dimensions in 1927 owing to increased purchases of young stock in 1926-27. The practice of keeping horse stock on the right hand

(1) It would be of interest to refer in this connection to Pearse's (1906) Characterisation of Surra Zones—" Low lying, marshy lands subject to partial inundation and subsequent partial drying up, covered with rough grass and jungle."

(2) In using the term " belt," it is recognised that as pointed out by Simpson (1917) the term cannot be used to indicate a tract that abounds in vectors in contradistinction to areas wherefrom they are entirely absent, since the question is obviously not one of entire presence or absence of vectors, but of their *relative* abundance.

side of Mona Road commenced only during recent years : the paddocks were originally situated in the directions marked in the map as 155, 184 and 200.

The depot boundary wire fencing previously extended from the lower corner of spot marked 192, along the course indicated as jungle in the map, to the end of Bruce Road. The fencing was, however, removed some years back, thereby allowing of free passage of animals from and into the Charge.

It is possible that owing to the lengthy period during which the Canal remained closed towards the end of 1927, collections of non-running water resulted and that Tabanids, instead of confining themselves to their usual breeding centres, travelled further afield, thereby into or unto the fringe of the Surra belt[3].

For a correct appreciation of the bearing of these factors upon the genesis of the outbreak of Surra at Mona, it would seem relevant to discuss briefly at this point the conditions that determine migration and localization of biting flies.

4. Etiological Factors in Relation to the Prevalence of Biting Flies.

These factors have been particularly studied by a number of workers in Africa in the course of their investigations upon outbreaks of Nagana in which, as is well known, the vector concerned is believed to be Glossina. The more important observations recorded in this connection may be summarised as follows : Mosier (1911-12) noticed that certain species of tsetse flies were curiously localised even within the limits of a fly belt, particularly about certain bushes and he referred to the desirability of investigations directed to ascertaining the factors that thus influence the flies to congregate. In a later paper, Mosier (1912) characterises the haunts of tsetse flies as deep shade places and in proximity to water and he mentions the interesting fact that the flies do not usually travel higher than 4—5 ft., and never as high as 10 ft. According to King (1912) the longest distance travelled by them is certainly at least a mile, although Lamborn (1915) states that the maximum range of flight of *Glossina* is 2½ miles.

According to Hamilton (1911-12), flies, as a rule, shun denuded foothills, whilst McConnell (1912) refers to the possibility that a game or human track may bridge a non-infected with an infected locality. Pollard (1912) states that *G. tachinoides* is associated either with the thick fringe of a bush at river sides or, where this is absent, with *Mimosa asperata*, whilst Macfie (1913-14) even goes as far as to correlate

(3) It may be mentioned in passing that the incidence of Surra in Mona Village in 1926 was considerably lower than in 1927.

a certain type of " scenery " with the distribution of tsetse. The observations recorded by Fiske (1913-14) are of considerable significance in their bearing upon the question of the conditions that determine the distribution of tsetse. According to this observer, (1) birds or the large reptiles, and not mammals, furnish the most favourable food for these flies ; (2) the superabundant individuals are disposed of by migration of the females, and the disparity of the sexes is thus to be explained ; (3) these migratory flights are " quite distinctly different " from the ordinary comings and goings and they take place following eclosion and fertilization and preceding full sexual maturity.

A mass of literature has also been consulted with a view to obtaining indications as to the facts that determine the migrations and the localization of the commoner species of Tabanidæ. In an interesting note published in the *Bulletin of Entomological Research* (1911-12), Macfie is reported to have observed that in N. Nigeria as many as six different species of Tabanidæ were attracted by a species of scale insect (*Ceroplastes egbarum*), and according to Osburn (1913), Tabanidæ are mostly inhabitants of " hydrolytic " areas. In an interesting paper published in 1914, Lutz referred to the fact that, in Rio-de-Janeiro, eggs of Tabanidæ were mostly deposited near the edge of running water and that the larvæ did not live long in still water (observations which would appear to be of significance in view of the Lower Jhelum forming the southern boundary of the Mona Charge). According to the experience of Portchinsky (1915) " water and plantations " are indispensable conditions in Russia for the existence and breeding of Tabanidæ, whilst Doten (1920) states that, in Nevada, eggs of Tabanidæ are deposited on short grass and sedgy growths in typical wet meadows, the larvæ thriving particularly in wet and soft soil. According to Hill (1921-22), the chief places for Tabanidæ in Australia are shallow swamps, which disappear completely in the winter or dry season, and often the full grown larvæ enter the soil in the vicinity of the water's edge, wherever that may be at the time of their reaching maturity ; further, as the soil dries, the larvæ are practically immobilized and remain quiescent until they become thoroughly moistened again, so that there can be no emergence of adult Tabanidæ until after heavy rains. King (1925-26) in Africa also noted that the usual habitat of Tabanid pupæ was damp sand or earth, although sometimes during the dry season the medium in which they lived became dry, apparently without their being adversely affected.

The fundamental fact that emerges from the observations recorded above is that, as stated by Portchinsky, the two conditions which constitute an ideal habitat for Tabanidæ are water and vegetation, both of which occur, as has been stated earlier in this paper in prolific

abundance at Mona. These conditions in themselves, however, can hardly be regarded as of importance in connection with the outbreak at Mona, unless the question is also viewed from the standpoint of the seasonal prevalence of Tabanidæ. A perusal of the numerous published observations on the subject definitely indicates that the seasonal abundance of these insects varies within so wide limits, in accordance with the localities in which they occur and the species of Tabanidæ concerned, that the factor would seem hardly to admit of generalisation. Thus, according to Aders (1913), Tabanidæ are most abundant in Zanzibar Protectorate in May, June and October, after the rains, whilst Hodwen (1914) in Columbia, noted that the distribution in time was very variable with the different species of the fly. King (1914-15) in Africa, found that, under laboratory conditions, the life-cycle of two broods of the same species of Tabanid (*T. diteniatus* which also occurs in India) was very variable ; thus, while with one brood, the period intervening between the deposition of eggs and the emergence of adults was from 24th June to 2nd November, with another brood it was from 25th July to 11th September. Similarly, Neave (1914-15), in Southern Nyassaland, found the length of the life-cycle of the different species to be extremely variable, although larvæ were, as a rule, found between July and August, in the sand and mud over the banks of the rivers, and pupation occurred at irregular periods, with the result that odd specimens of Tabanidæ appeared " out of season." Marchand (1917), writing of *Chrysops callidus*, stated that, in America, the species occurred from the latter part of May to the end of July, whilst Mosier and Snyder (1919) in Florida, observed that the occurrence of *T. Americanus* and *T. Trijunctus* was restricted from February to June and March to April, but other species occurred " throughout the year." The extent of variability in the seasonal prevalence of the different species of Tabanidæ is strikingly illustrated in the observations recorded by Patton (1920) in Mesopotamia where, according to him, *T. perlchatus* occurs from April to October ; *T. glabr* from August to November ; and *T. polygonus* from March to September. Hill (1921-22) made a careful study of the conditions that determine the seasonal prevalence of Tabanidæ in Australia. According to this observer, Tabanidæ occur during the months of October to April, throughout Australia, except perhaps in the wet belts of the North Queensland Coast. In the southern regions, where there are regular winter rains and low winter temperatures, the emergence of adults was found to be regulated by temperature and not by rainfall. In the north, where the temperature is more or less equable and the rainfall is, except for moderate falls, confined to the summer months, the condition of the soil is, according to him, most certainly the regulating factor. Thus " almost invariably,

the march-fly season is either early or late, good or bad (from the collector's point of view) according to whether the summer rain is early or late and normally heavy, light or absent."

In the Indian Region, the life history of Tabanidæ has particularly been studied by Patton (1913) in Madras, by Howlett at Pusa, and, during recent years, by Fletcher, Patel and Issac at Pusa. From numerous experiments with the Madras species it was found by Patton that the complete life-history from the egg to the imago lasted from four to five months, and that there were usually two broods during the year. Fletcher (1916-17) considers it likely that at any rate, so far as *T. nemocallosus* (experimently proved to be capable of transmitting Surra in the Punjab), is concerned, there is one brood of this species in India. This author (1920-21) further records the fact that *T. albiedius, T. bicallosus* (both of which have been experimently shown to be Surra carriers) and *Chrysops* sp. freely oviposited in March, 1921, on leaves of *Polygonum*, along the banks of a river at Pusa. If March is about the time when oviposition occurs in the case of the commoner species of Tabanidæ in India it may perhaps reasonably be concluded that the possibility of their occurrence in the depot in November—December (when the outbreak occurred) is very remote—irrespective of the fact whether there is only one or two broods of these species in the year. In any case, the writer of this article failed to secure a single specimen of Tabanid at Mona during the course of the outbreak, although a careful search was kept up for them from day to day.

5. History of Present Outbreak.

As has been stated earlier, the outbreak was strictly confined to animals in Mona Charge of the Depot. The Charge comprised 1094 animals, and out of them 143 were affected, the largest number of cases (94) having occurred at the Road Paddock, where only three horses escaped infection. The disease manifested itself in an extraordinarily virulent form, as was shown by the affected horses becoming paralysed and comatosed within two or three days of the appearance of the trypanosomes in the circulating blood, and Trypanosomes were observed during routine blood examinations even in animals with *complete absence of clinical symptoms*. All animals were subjected to blood and temperature examination every second day up to the middle of January, while those in the Hospital were examined daily. 18,328 blood examinations (for which seven microscopes were in constant use) were thus carried out during the outbreak, and any animal found negative to blood examination but running a temperature, was received from the Charge for daily temperature recording and blood examination.

In the absence of precise knowledge as to the period of incubation in *naturally* contracted Surra, it is obviously impossible to formulate a working hypothesis as to the locality where the disease may have been initially contracted. From the point of view of insect vectors both No. 3 Paddock and Mundi Paddock would appear to be the most likely sources of infection, seeing that these paddocks are not only low-lying, but they closely adjoin wooded parts and cultivated lands and are situated nearest to the Mona Village, where a number of Surra-infected dogs were found. On the other hand, there is a considerable amount of presumptive evidence in support of the view that all the animals contracted Surra in the Road Paddock, since there is a consensus of opinion that it would be most exceptional for the incubation period of the disease to extend beyond two weeks ; at any rate, the period has rarely been observed to exceed five to six days in artificially induced Surra (Edwards, 1928). The supposition is further warranted by the fact that the horses kept in this paddock frequently wandered and grazed in dangerous proximity to the Surra zone, namely the Western boundary of the depot. The period of incubation in the case of the animals concerned in the present outbreak must have been relatively short, since, as has already been stated, the disease raged in an exceptionally virulent form throughout the progress of the outbreak. It should also be mentioned that the affected animals were young stock horses and mostly by foreign sires, and therefore their resistance to the disease both in the incubative and active stages was likely to have been low.

Before concluding this section, it should be mentioned that, although Road Paddock itself compares very unfavourably with Paddock No. 3 and Mundi Paddock as a habitat for blood-sucking flies, it has a deep water channel with a heavy growth of pampas grass running along its entire length, and its horses were allowed to graze east of Mona Road, so that, possibly, at times, owing to the absence of wire fencing, they wandered into the wooded parts with considerable undergrowth and vegetation.

6. Discussion upon the Possible Genesis of the Outbreak

The most noticeable features in connection with the outbreak is its concentration both in time and space, since, as has been stated, the outbreak was practically confined to the Road Paddock[5] and lasted from about the middle of November to the end of December.

All the animals in the Mona Charge had been subjected to a close examination from the 28th October to the 2nd November, 1927, in connection with the annual inspection of the stock for soundness, and none of them had aroused the slightest suspicion of having been

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infected with Surra. As circumstantial clinical evidence in support of this finding it may be mentioned that blood-sucking flies, notably *Stomoxys*, were numerous in October (much more so than in mid-November) throughout the depot, so that if Surra had been present during this period, one would have expected the whole charge to be affected.

In endeavouring to account for the outbreak at Mona, it would be instructive to consider at this stage the circumstances, as recorded by various observers, attending similar outbreaks elsewhere in the world, and also the conclusion drawn by them—although tentatively—in regard to the nature of the vectors possibly concerned in the transmission of the disease. Cheireddin and collaborators (1917) described the occurrence of an outbreak of Surra in Palestine during the campaign of 1915 and they would appear definitely to associate Tabanidæ with the outbreak. Similarly, Ferguson (1923) incriminates Tabanidæ as being responsible for an outbreak of Surra in Western Australia. Sergent and Donatien (1922) believed that trypanosomiasis of camels in North Africa was transmitted by Tabanidæ in open country and by *Stomoxys* in more inhabited localities. In discussing the origin of certain outbreaks of Surra in Mesopotamia, Patton (1922) refers to the possibility of intermittent feeders, like *Musca*, being the vectors concerned. Stuart and Krikorian (1923) make an interesting deduction from a consideration of the factors that preceded a severe outbreak of equine Surra in Palestine in 1923. These authors state that there is no evidence of the occurrence of Surra in Palestine before the War, although it is reported that in 1917 an epidemic occurred amongst camels only. Assuming this to be correct, the facts that camels may suffer from a chronic form of the disease, lasting 2 to 4 years, and that *Stomoxys* and Tabanidæ are abundant throughout Palestine complete the chain of circumstantial evidence to indicate that, in the case of the outbreak of equine Surra in Palestine, camels constituted the reservoir of infection[4].

In a very recent paper, Movtia (1928) brings forward a considerable amount of suggestive evidence to indicate that in the several outbreaks of Surra that occurred in Mauritius, the vector concerned was *Stomoxys nigra*. The first of these outbreaks occurred in September, 1901, in a consignment of cattle imported into Mauritius from India. As described by Movtia, the scourge spread rapidly among equines and cattle throughout the island, the number of deaths recorded from July to October, 1902, being 1,882 equines and 1,681 cattle. The reason for suspecting *S. nigra* as the vector in the outbreak is that, out of 2,000 insects collected in the course of an insect survey in the island, the

(4) Leckie (1925) observes, however, that he has never been able to confirm this.

proportion of *S. nigra* captured amounted to 99 per cent. Moreover, under laboratory conditions, *S. nigra* proved capable of transmitting the disease directly, provided that the interval between the ingestion of the virulent blood by the insect and its infective bite did not exceed 10 minutes.

Bousche and Burnard (1913), writing of *T. annamense* (which according to Laveran and Mesnil, is closely related to *T. evansi*) referred to the significant fact that the groups of animals sent to pasture in areas covered with brushwood provided all the cases of sickness, whilst those kept in stables and allowed out only during the night or cool sunless days remained absolutely healthy, so that it was unlikely that the stable fly (*Stomoxys*) acted as an intermediary in the spread of the disease. On the other hand, Curasson (1928), writing of *M. bori* (regarded by some as being identical with Surra) points out that this disease of camels occurs especially in swampy districts where "*Stomoxys* are very numerous."

In India, Hoole (1911-12), in Ceylon, believed that Surra was carried by a species of *Stomoxys*, which swarmed to such an extent in daylight that "a horse could not stand still for a minute out of doors." Again, Leese (1909), who carried out extensive observations on Surra at Mohand (U.P.), cited the fact that *Tabanus*, *Stomoxys* and *Hæmatopta* were very scanty during the hot weather (1st February to 28th June), but very numerous during the Rains (28th June to 24th September), when Surra is most prevalent, whereas *Hippobosca maculata* was of uniform occurrence throughout both these seasons. Although he recognised the impossibility, from such observations, of incriminating exclusively any one of these groups with the transmission of Surra, he, however, considered that the general distribution of *Stomoxys* was against playing an important part in the propagation of the disease. Branford (1919) would appear to regard Tabanus as the vector concerned in an outbreak of Surra at Hissar during August-October, 1917, when "Tabanidæ were numerous and *Stomoxys* and *Chrysops* were swarming everywhere." He observes, "In this outbreak everything points to a Tabanus being the agent of transmission," and in support of this contention he cites the fact that the disease was not transmitted to a roan "literally black" with *Stomoxys* and *Lyperosia*, although it was kept with a pony mare affected with Surra.

The results of numerous transmission experiments performed, under laboratory conditions, by various workers (e.g. Leese, Cross and Patel, Cross and Kahan, Singh, Mitzmain, Nieschula) have definitely proved that certain species of insects, notably Tabanidæ[5], are capable

(5) According to MacGregor (1917) Tabanidæ of the species *T. striatus* are certain vectors of Surra.

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of acting as mechanical carriers of Surra, but the value of these results as an aid in the investigation of the genesis of a *natural* outbreak of the disease is obviously very limited, since a simply mechanical, as opposed to cyclical, transmission of the disease is doubtless capable of being effected by members of widely separated species of insects[6]. Even in the case of nagana, in which the only vector concerned is believed to be *Glossina*, the disease has been proved to exist in localities in the absence of insects of the genus. Thus, according to Howard (1911-12), cattle trypanosomiasis was present in certain parts of Zambesi in 1908-11, but a careful search in the adjoining regions failed to disclose the presence of tsetse, the natives being entirely ignorant of it, and " all the facts went to indicate that the disease had been introduced through the herds by local biting flies, such as Stomoxys and Tabanidæ." Similarly, Aders (1913) noted the occurrence of trypanosomiasis in Zanzibar in the absence of tsetse, and in a later paper, he (1923) records the occurrence of *T. congolense* where Tabanidæ were abundant, although the disease was less frequently met with in localities where *Stomoxys* and *Lyperosia* were more plentiful.

Similarly, Chambers (1917), in Northern Rhodesia, and Dry (1921-22), in Kenya, refer to the possibility of the transmission of trypanosomiasis in the absence of *Glossina*.

7. Summary and Conclusions.

In regard to the outbreak of Surra at Mona, the question of the locality where the initial infection is likely to have occurred has already been discussed at length earlier in this paper. It now remains to endeavour to make a deduction, from the circumstantial evidence afforded as to the nature of the vectors that may have been concerned in the outbreak. In regard to this, the following possibilities present themselves :—

(*a*) That the vectors concerned were one or more species of Tabanidæ. If this is so, the infection is most likely to have occurred in Paddock No. 3, where the animals remained up to the 12th October, which is about the end of the season for Tabanidæ. The incubative period of naturally contracted Surra must then be more than a month, since the first case in the depot was not detected until the 18th November[7].

(6) As emphasized by Owen (1914), however, mechanical transmission can become a serious factor when given suitable opportunities.

(7) Referring to the question of the incubation period of naturally contracted Surra, Lingard (1899) observes : " I regret I cannot afford any accurate information. I should think from twenty-five to seventy days or longer . . . . The insidious nature of the onset in naturally contracted disease, devoid of symptoms for a considerable period, renders it impossible to recognise it, until such time as the organism appears in the blood."

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(*b*) That the disease was transmitted through the agency of flies other than Tabanidæ (e.g. *Stomoxys*, Hæmatophagous muscids, etc.,) and, in that event, infection may have occurred in any one of the three paddocks (No. 3, Road and Mundi).

(*c*) On the other hand, the fact that the outbreak raged during December, when no blood-sucking flies were in evidence, points to the interesting possibility that flies were not—at any rate, the only—transmitters of the disease[8].

8. Measures Recommended to Prevent a Recurrence of Surra at Mona Depot.

1. The first desideratum in combating a further outbreak of Surra at Mona Depot is the inauguration, during July-November, of a systematic campaign for detecting diseased animals in all villages adjacent to Mona. An organisation on similar lines would appear to be already in existence in Mauritius, where, according to Movtia (*loc. cit.*), inspections of all equines and bovines for Surra are conducted by Stock Inspectors working under a Government Veterinary Surgeon. These Stock Inspectors forward smears of blood from animals to Head Office for examination, and all bovines found to be suffering from disease are placed in quarantine in their respective stables, and the owners are notified that unless treatment of the affected animals was carried out within 48 hours, the animals would be slaughtered.

2. Measures should be devised with a view to effecting a *thorough* clearance of all jungle and undergrowth in and surrounding the depot. In connection with these operations, the recommendations suggested by Fell (1912), apropos of the control of *Glossina*, are worthy of especial mention ; " Forest clearing, not effectively maintained, produces a scrub-growth which is more favourable to tsetse flies than the forest itself. In the rains, this secondary scrub grows at an enormous rate, and cannot be coped with, except with constant and extensive labour."

Mosier (1913-14) also refers to the " complete disappearance of the flies " in certain localities " brought about by clearing the whole of the undergrowth, leaving the tall shady trees standing." Similarly, Duke (1919-20) deprecates " indiscriminate and patchy burning " of jungle for controlling *Glossina*.

3. *Direct control of vectors.* As all blood-sucking flies must be regarded as potential carriers of Surra, measures directed exclusively against any one class of blood-suckers may turn out to be valueless in combating an outbreak of the disease. The cardinal principle underlying all measures designed to keep flies in check should be the reduc-

(8) Cross and Patel (1921) have incriminated the tick, *Ornithodorus Crossi*, as being capable of transmitting Surra cyclically. Ticks were, however, found to be absent from the Depot during the progress of the outbreak.

tion of their breeding places, since, as Fiske (cited by Duke, 1918-19) observes : " Restrict the breeding grounds and there is a corresponding decrease in abundance of fly." This connotes the observance of scrupulous cleanliness by the proper disposal of manure (especially horse manure, which is a favourable breeding material for *Stomoxys*), kitchen garbage and miscellaneous refuse, and the prevention of water logging calculated to encourage the breeding of Tabanidæ.

A number of workers (e.g. Portchinsky, 1915 ; Girault, 1916 ; Fletcher, 1921 ; Nieschulz, 1926 ; Cameron, 1926) have mentioned a hymenopterous insect (*Phanurus sp.*) which is parasitic on the eggs of Tabanidæ, whilst Lloyd (1912) refers to large Tabanidæ constituting a favourite food of the predatory flies of the family of Asilidæ[9]. It is, however, doubtful whether these so called " beneficial " insects exercise any appreciable check upon Tabanidæ.

The feasibility of the so called " biological " method of controlling biting flies would appear now to be viewed with positive disfavour (e.g. by Nieschulz, 1925) and the magnitude of the concerted campaign that would be needed to obliterate the breeding grounds of Tabanidæ alone is indicated by the fact that, according to Patton (1920) these flies are capable of migrating to a distance of as many as 5 to 6 miles from their breeding places.

In the present state of our knowledge, the only rational prophylaxis calculated to keep Surra in check in the scene of an outbreak is the periodical administration of an efficient trypanocidal agent into the animals exposed to infection, and the drug that has now proved best suited for this purpose is " Bayer 205 " when given intravenously at the rate of 10 cc. of a 10 per cent. solution per 1,000 lbs. bodyweight (i.e. 1 gram per 1,000 lbs.) at fortnightly intervals, until the danger of infection has disappeared (Edwards, 1928).

(9) The writer has also observed Tabanidæ being fairly extensively preyed upon by these flies.

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COLONIAL VETERINARY SCHOLARSHIPS.*

1. It was decided in November, 1929, that a certain number of post-graduate scholarships in Veterinary Science should be offered annually, with a view to the creation of a pool of qualified candidates from which vacancies in the Colonial Veterinary Departments could be filled. It is intended that up to ten scholarships should be available annually, at any rate during the years 1930 to 1938 inclusive, which will be regarded as an experimental period. The question of the continuance of the scheme will be examined in 1937. Due notice will be given should it be decided not to continue the scheme or to introduce important modifications into it. The scholarships are designed both to attract to veterinary science men who have already been trained in general science at a University and have shown a bent for scientific work, and to encourage men who have already embarked on a veterinary training, and have shown aptitude for the work, to develop further the scientific side of their education.

2. The scholarships will not carry with them any *guarantee* that the holders will subsequently receive appointments in the Colonial Services, as the number of vacancies in the Colonial Veterinary Departments necessarily varies from year to year. It is expected, however, that scholars *will usually be offered* such appointments on the conclusion of their training, provided that their work and conduct have been satisfactory ; and it is intended that from 1932 onwards vacant Colonial appointments should be filled as far as possible by the selection of scholars with whose progress and suitability the Secretary of State is satisfied.

3. It is not intended to lay down any precise definition of the qualifications which an applicant for a Colonial Veterinary Scholarship should possess ; but in general a candidate should be in possession of, or be about to qualify for

(i) a science degree of a British University, or some equivalent qualification ; or

(ii) the Diploma of Membership of the Royal College of Veterinary Surgeons.

4. A scholarship will be tenable for from one to four years, each individual case being judged on its merits, and the period of training will be regulated accordingly. Thus a candidate holding the Diploma of Membership of the Royal College of Veterinary Surgeons and the degree of B.Sc. or B.V.Sc. might be granted a scholarship *for two years* in order to take a further degree or *to undertake research under supervision* at an approved institution ; or a candidate holding the Diploma of Membership of the Royal College of Veterinary Surgeons might be

* Received from the Colonial Office, February, 1930.

granted a scholarship for two or three years in order to complete a degree in some special biological subject. A candidate holding a degree in science might be granted a scholarship for four years whilst qualifying for the Diploma of Membership of the Royal College of Veterinary Surgeons. In some instances a scholarship for one year only might be granted.

5. A scholarship will be of the value of £250 per annum, from which the scholar will be required to pay the fees charged by any training institutions which he is required to attend. It should be clearly understood that these grants are intended to assist scholars materially with the expenses of their training, but not necessarily to cover the whole of their out-of-pocket expenses. Each scholar will be provided in addition to the scholarship with an allowance not exceeding £12 for the purpose of purchasing approved books.

6. The selection of candidates will be made annually in the summer by the Secretary of State for the Colonies. Candidates may be required to attend for interview before an Advisory Selection Committee.

7. Applications for scholarships should be made on the forms supplied for the use of candidates for appointment to the Colonial Services. A request for a form of application should ordinarily be addressed in writing direct to the Private Secretary (Appointments), 2, Richmond Terrace, Whitehall, S.W.1. A candidate resident in a Colony or Dominion should, however, submit his request to the Governor (in the case of a Colony) or appropriate authority (in that of a Dominion) and not to the Private Secretary (Appointments). Arrangements are in force whereby a candidate who submits his application to the Governor of a Colony, or the appropriate authority in a Dominion, may be interviewed locally. Completed applications should be received by the Private Secretary (Appointments) preferably before the end of May and in any case not later than the 15th of June. A candidate resident in a Colony or Dominion should accordingly submit his application early in the year. It should be clearly understood that a candidate who desires to be considered for a scholarship and is due to take his final examination in the summer should send in his application before doing so. This will not oblige him to accept a scholarship, should he be offered one, but will enable the Private Secretary (Appointments) to complete his application papers before the selection of candidates is made. A candidate who delays sending in his application papers until later runs the risk of its being found impossible for him to be considered at all, as it is the intention that the award of scholarships should be completed each year during July, in order that adequate time may be available for the arrangement of suitable courses of training.

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8. A selected candidate will be required to be medically examined by the Consulting Physician to the Colonial Office (or, in the case of those residing in a Colony or Dominion, by a Medical Officer appointed by the Colonial Government or appropriate authority). Provided he passes the examination and signs the bond mentioned below, he will receive an initial grant of £83 6s. 8d. He will receive a further grant of the same amount at the commencement of the second and of each succeeding University term to which the period of his scholarship extends on production of a certificate from the Head or Heads of the institution or institutions where he was last working that his conduct and progress in his studies were satisfactory.

9. A candidate selected for a scholarship will also be required to sign an undertaking that he will be willing on the conclusion of his scholarship to take up an appointment, if required, in any Colony to which he may be allotted and to serve there for not less than three years or, failing the fulfilment of these conditions, to refund the sum of £200 in consideration of the expenditure incurred in his training. The undertaking will be in the form of a bond with two sureties and will provide for the refund of the sum of £200 or such lesser amount as the selected candidate may up to that date have received as above if

(*a*) he fails to complete his scholarship period successfully within the time allotted, or receives an adverse report as to industry, character, or conduct such as would in the opinion of the Secretary of State render him ineligible for an appointment in one of the Colonial Services ; or

(*b*) having been selected for an appointment in one of the Colonial Services he fails to take up his appointment when instructed to do so ; or

(*c*) he resigns from or is removed from the service of the Dependency to which he is appointed within three years of his arrival on first appointment in such Dependency. (Should a candidate selected for scholarship be reported by the Consulting Physician to the Colonial Office at his second examination to be unfit for service, he should be retired from the service of the Dependency to which he had been appointed on the termination of his scholarship upon the report of a Government Medical Officer, that he was unfit for service in the Dependency, no claim would be made for a refund.)

10. The Colonial Office will keep in touch with all scholars and will obtain periodical reports as to their progress. It will at any time be open to the Secretary of State to terminate the scholarship of a scholar whose conduct, industry, or progress is not regarded as satisfactory.

11. If a scholar is selected for an appointment in one of the Colonial Services any preference he may express as to the Dependency in which

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he wishes to serve and the duties which he will be called upon to perform will be met as far as possible.

12. When the scholar has been selected for an appointment he will again be examined by the Consulting Physician to the Colonial Office: and if passed fit will have to proceed as soon as required to take up his appointment in the Dependency to which he has been assigned.

13. A scholar whose final selection has been approved will ordinarily be appointed on probation as a junior officer on his arrival in the Dependency. His emoluments and conditions of service will be those in force at the time for the grade of appointment in the particular Dependency.

14. Those scholarship holders who are unsuccessful in obtaining appointments will be free to take private employment or to enter their names for consideration in connection with vacancies in the Colonial Services which may occur later.

COLONIAL OFFICE,
January, 1930.

Clinical Articles

Necrosis of the Palatal Flap in a Camel.

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AND
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A ONE-HUMPED male Bikaneri camel (*Camelius dromedarius*), aged about eight years, was purchased while rutting or "*must*" on the 20th December, 1929, morning, for patrol of grazing lands at the Government Cattle Farm, Hissar. He went off feed the same evening, and on the following day the camel-*sawar* reported excessive foaming from the mouth, gurgling pharyngeal noise and the presence of some wounds in the mouth, adding that the animal kept his tongue protruded with the "*gildhar*" or "*palloo*" (membranous fold attached to the soft palate) overlapping it. Examination revealed nothing extraordinarily abnormal, since all these symptoms are characteristic in rutting of male camels. The mouth was washed with simple alum lotion and soft linseed gruel advised. The camel refused even the gruel and had to be drenched with difficulty.

On the 23rd, morning, the *sawar* further reported that the animal had been off feed ever since, and that while belching he had seen,

though only once or twice, something torn and blackish sticking out in the mouth. The animal was properly and firmly secured in the sitting position, mouth-gag applied and the oral cavity examined again, but nothing beyond a few superficial wounds was noticed. After washing the mouth clean of all froth, the hand was *cautiously* pushed towards the pharynx, the palatal flap or "*gildhar*" seized and brought out. It was found necrosed at several places with the anterior portion badly torn. What had really happened was that as the palatal flap had protruded during belching, it had got entangled in the incisor teeth and got torn before receding to its normal position. Necrosis of the part started and the animal as a result could not feed well and produced gurgling noises. Nearly the whole of the palatal flap, more than a foot in length, was cut off with a sharp knife, and to our great surprise no bleeding occurred during the operation. The mouth was subsequently washed with alum lotion and soft foods advised. The animal made an uneventful recovery.

"*Must*" camels fall off considerably in general bodily condition due to loss of appetite, etc., to a great extent. We have, however, never come across any publication in which mention might have been made of cases where palatal flaps may have got injured and torn by being caught in the incisor teeth with subsequent necrosis of the part. We believe that the afore-mentioned condition is not altogether rare amongst rutting camels, since there is every likelihood of the flap getting caught in sharp incisor teeth during its protrusion. Our colleague, Capt. Walker, of the Punjab Veterinary College, informs us that he has heard of two or three such cases from Egypt. This observation is recorded for the benefit of camel practitioners who often come across "*must*" camels which keep off feed for long periods and show signs of asphyxiation. The condition, if neglected and left unattended to, is liable to cause further complications and death. It is advisable in such cases to cut the "*gildhar*" off at its root, but the hand must be introduced into the oral cavity to seize it with great caution with the head of the animal looking upwards. Carelessness in this means asking for serious trouble. The excision of the palatal flap does not bring about any untoward results.

An Outbreak of Spirochætal Jaundice.

By H. M. HOLLAND, F.R.C.V.S.,
Keighley.

SEVERAL of the hounds of the Airedale Hunt Pack commenced to show symptoms of "yellows" as far back as last October. The disease appeared in a mild form and few casualties occurred, but as time went

on the disease took quite a virulent form and during November and December about 15 hounds died after a period of 5-6 days' visible illness. During this period the huntsman called to see me on three or four occasions, and we discussed the situation and on the last occasion decided that the treatment that was being carried out was doing no good. It consisted in altering the diet and putting the affected hounds on to liquid food, raw meat, liver and tripe, the administration of purgative doses of calomel when required, and Tinct. Taraxici twice daily. Up till then I had only given advice and medicine and had not been asked to visit. However, I decided that we were dealing with a condition which gave every indication of an infective nature, and unless an examination of the affected animals was made, the pack would soon be wiped out. I visited the kennels on the 22nd December, 1929, and made *post-mortems* of two hounds which had died on the 21st. In each case the dog would be about two years old. Externally the tissues appeared intensely yellow, the mucous membrane of the mouth was similarly coloured. The conjunctival membrane and the sclerotic coat of the eyes were also deeply tinted. The liver in each case was distinctly enlarged and varied in tint from a light yellow to a deep orange, and the other organs of the body were, if one might use the expression, saturated with bile. The substance of the liver had a fatty consistence and when cut into showed a variation of tinting. Three affected hounds were dull and listless, without appetite, with greatly increased thirst and frequent vomiting, and passing orange coloured urine, and mucous as fæces. I concluded that this was an outbreak of Spirochætal Jaundice and wired off to Burroughs Wellcome for a supply of Anti-Leptospi Serum, which I intravenously injected into each of 12 affected animals, 9 of which recovered in from 2-3 days, and 3 above referred to died as was to be expected, having got to the final stage of the disease before serum could be obtained.

WEINBERG PEN TRIALS FOR JEWISH SLAUGHTER: COMMITTEE REPORT.*

REPORT OF MEETING HELD ON THE 14TH JANUARY, 1930, AT THE ISLINGTON CATTLE MARKET.

Chairman: Professor F. T. G. Hobday, C.M.G., F.R.C.V.S., F.R.S.E., Principal of the Royal Veterinary College.

Hon. Secretary: Capt. C. W. Hume, M.C., B.Sc., Hon. Secretary of the University of London Animal Welfare Society.

Rabbi Dr. Samuel Daiches (Board of Deputies of British Jews).

* This Committee was formed to test the claim of the inventor (Mr. Weinberg) that his machine introduces a method of casting cattle for Jewish slaughter which is humane.

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Mr. James R. Hayhurst, M.R.C.V.S., D.V.S.M., Superintendent and Chief Veterinary Inspector, Metropolitan Cattle Market.

Mr. A. Lloyd, M.R.C.V.S., Assistant Veterinary Inspector, Metropolitan Cattle Market.

Lt.-Col. T. Dunlop Young, O.B.E., M.R.C.V.S., D.V.S.M., Veterinary Inspector, Central Markets, Smithfield.

Capt. H. L. Torrance, M.R.C.V.S., D.V.S.M., Veterinary Inspector, Birkenhead.

Mr. Arthur D. Bray, Chairman of the Markets Committee of the City of London Corporation.

Mr. Fred Whittingham, Ex-Chairman of the Markets Committee of the City of London Corporation.

Mr. M. W. Hill, representing Mr. Salmon for the Slaughtermen's Branch of the Union of Allied Workers.

Miss Violet Wood (Secretary of the Council of Justice to Animals).

Mr. Elsley Zeitlyn, Chairman of the Shecheta Committee, Board of Deputies of British Jews.

Mr. N. S. Lucas, M.B., representing Prof. C. Lovatt Evans, F.R.S., Todrell Professor of Physiology.

Professor A. Gofton, F.R.C.V.S., Chief Veterinary Inspector, Edinburgh.

Major Gen. Sir John Moore, K.C.M.G., C.B., F.R.C.V.S.

Major W. J. Brennan DeVine, M.C., F.R.C.V.S., D.V.S.M., Chief Veterinary Inspector, Birmingham Corporation.

Capt. W. K. Johnstone, M.R.C.V.S., Chief Veterinary Inspector, Manchester Abattoirs.

Mr. J. Levitta, Chief Schochet.

Mr. L. A. Legros, M.Inst.C.E., M.I.Mech.E., Consulting Engineer to the Board of Shecheta.

Mr. R. Paddison (Royal Society for the Prevention of Cruelty to Animals).

Report.

1. Confirmation of minutes of meeting held at Islington on the 9th January, 1928.

It was proposed by Mr. Bray, the Chairman of the Markets Committee, and seconded by Sir John Moore, that these minutes be taken as read.

2. Confirmation of minutes of meeting held at Leeds on the 27th March, 1929.

It was unanimously agreed that these minutes also be taken as read.

3. (*a*) Reception of Engineers' reports on durability test, 1930.

It was proposed by Prof. Gofton and seconded by Capt. Torrance that the Engineers' reports be received and adopted.

(*b*) Report from Sir John Moore, one of the delegates appointed by arrangement with Mr. Hayhurst.

It was agreed that during the durability trials only the following persons be admitted to the slaughterhouse: Professor Hobday, Sir John Moore, Mr. Legros, Dr. Underwood (or his assistant, Mr. Hollis), and Mr. Weinberg. Professor Hobday and myself undertook to be fully responsible for any matters which might arise, and to deal directly with the carcase butchers and slaughtermen in connection with any difficulties which might arise during the test. I attended the durability test as much as I possibly could, and I have made a special report.

The Chairman of Committee, Weinberg Casting Pen.

Dear Sir,

By arrangement made through Mr. J. R. Hayhurst on behalf of the Cattle Markets Committee, I beg to report that I was one of the delegates appointed to supervise the durability test of the Weinberg Casting Pen, the test to be made on 200 animals of varying breeds and sizes, including a proportion of bulls.

I paid as many visits to the Islington Cattle Market and Abattoirs as circumstances permitted, and have much pleasure in giving my opinion of the trial as follows:

(1) From personal observation of the method and a consideration of the times carefully taken by Mr. Legros and Mr. Hollis on behalf of the Trial Committee I have no hesitation in saying that the Weinberg Casting Pen has not only proved its durability but that it is an efficient and safe method of dealing with animals for slaughter. From a time point of view in handling for despatch it carries advantage over the usual methods of slaughter; it is moreover easy to work, and is safe for slaughtermen.

(2) What to my mind is its chief merit is that it is a most humane system of handling animals for slaughter, a matter which I most strongly desire to emphasize. I am sure that all who have a regard for animals are anxious that their slaughter for purposes of food should be carried out in as humane a manner as possible, fully realising that present methods in many instances are susceptible of improvement. The Weinberg Casting Pen supplies a desirable necessity whether considered from the Jewish standpoint or otherwise.

(3) In my opinion the system, which the Weinberg Casting Pen serves to show, could be perfected. It would be possible, for instance, for the apparatus, or an improved apparatus, to be worked by electricity, silently, slowly revolving, stopping as desired, etc.,

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in as easy a manner for example as the ordinary " lift " in houses of business. Rough handling would be reduced to an absolute minimum, and bruising altogether avoided.

(Signed) J. MOORE.

The chief merits of the Pen have been alluded to and I express for myself, and for the other members of the Committee who were asked to supervise the trial, a debt of gratitude to Mr. Legros and Mr. Hollis for the times which they have kept and for the work they have carried out.

A vote of thanks to Sir John Moore for his Report was proposed by Professor Gofton, seconded by Capt. Hume, and carried unanimously.

Mr. Hill : " I wish to know whether the men in any way obstructed or whether they collaborated in the tests ? "

Sir John Moore : " The men carried out their duties most efficiently. They did not obstruct in any way. It seemed to be their desire that the work should proceed as smoothly as possible. A certain amount of thanks is due to the men for their part in the working of the pen. I am sorry I did not attend more regularly but I was the victim of circumstance."

Mr. Hill : " My reason for raising the question was that I understood these tests were made to find out the efficiency of the machine."

Prof. Hobday : " I can absolutely support all that Sir John Moore has said in regard to the men. They have worked well. Mr. Weinberg has also said how very well he has been supported in his effort for the machine to have a fair trial. Everything has been carried out from the men's point of view, and from every other point of view, without any complaint."

A formal vote of thanks was passed unanimously to Mr. Legros and Mr. Hollis.

4. Committee's report to the Board of Shecheta on :—

Durability of Machine.

Prof. Hobday : " Nothing has been done to the machine during the tests except the tightening of a few bolts. Both Mr. Legros and Mr. Hollis are satisfied with the machine."

Mr. Paddison : " Has the durability trial made any material difference to the machine ? The question is not what the pen is, but what it is likely to be."

Mr. Legros : " You ask whether the machine is so designed that it will last for a considerable time in addition to what we have seen. There is nothing unmechanical about the machine, such as might cause

failure from fatigue. It is a machine which should stand for a number of years with, of course, the usual periodical overhauling."

Prof. Hobday : " Nothing whatever has gone wrong with the machine during the test of 200 animals."

Mr. Legros : " The machine requires modification to the locking bolt. It was more satisfactory to carry out the test as the machine was, because if you alter one thing you will always find there are other things which also need altering."

Humane Aspect.

Dr. Daiches : " I saw the machine for the first time to-day and was very much impressed by the smoothness of its working."

Prof. Gofton : " I should like to congratulate Mr. Weinberg on the great improvement of the working of the machine as compared with the last time I saw it at the Islington Slaughterhouse two years ago. It did at that time leave room for criticism. To-day it has worked wonderfully. For myself I am quite satisfied that the method is a great improvement on the existing method of casting for Shecheta. More particularly from the humane standpoint is it a great improvement on the existing method. I should like to go the whole length and say that it should be adopted or recommend its adoption. I think there are some relatively small details to be attended to, and I should like to stop a little short of recommending the adoption until these details have been introduced into the machine."

Resolution proposed by Prof. Gofton :

> *That this Committee is satisfied that the Weinberg Machine, as demonstrated both by the durability test and the final trial held to-day, fulfils the objects for which it is designed, and constitutes a great improvement from a humane standpoint on existing methods of casting animals for Shecheta; and recommends its adoption in place of present methods.*

The resolution was seconded by Mr. Paddison.

Major Brennan DeVine : " The machine, as we can see, is a very great improvement on the present methods of slaughter from the humane and business points of view—the saving of time and the safety of the slaughtermen. I think this machine should be recommended by the Weinberg Committee as a good thing, and that it is a great improvement on the present method of casting. We may also take it that the Jews in different parts of the country will make improvements. I have no hesitation in supporting the resolution that it be recommended for use as a great improvement on the present method."

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Mr. Legros : " In trials of this kind we always find that there is something which might be better. One simply bears the suggested improvements in mind for the next model. We can quite understand that Mr. Weinberg would embody any recommendations in his next model. I did not want to put anything down in my report as a reflection on the machine, but merely a list of those improvements which are obvious. They do not, however, affect his patent. They only make it easier for the operator and less time is taken."

Dr. Daiches : " I should like to support this motion."

Mr. Zeitlyn : " I should like to associate myself with the remarks of the last speaker but one, that this Committee should recommend the adoption of the Weinberg Machine. I am bearing in mind the report of Sir John Moore and the recollection of his commendation that ' it is an efficient and safe method for dealing with animals for slaughter,' on which he has made emphasis. I have no doubt that the improvements which are suggested are not improvements which have anything to do with the efficiency of the machine but to the development of the machine. Those are things which are incidental. If this Committee thinks, as Sir John Moore thinks, that it is a most humane method I think there should be no delay in telling the world at large that it is an improvement and we ought to use it. I am thinking more particularly of the effect upon those who would like to adopt some method which would place them beyond reproach ; and I should be very glad, in view of the position I occupy, that the Committee arrive at a decision which is unanimous."

Mr. Paddison : " I think the resolution should read ' adoption throughout the country.' "

Major Brennan DeVine : " If we say ' recommend its adoption in place of present methods throughout the country ' the conditions of slaughterhouses may find it very difficult to acquire this pen, also the makers may make the conditions very difficult."

Mr. Hayhurst : " I disagree with Major DeVine. It is the third time this machine has been installed at Islington, and as a result of the last meeting I have been instructed to place no obstacles in the way. Sir John Moore has told you that as soon as the durability test was arranged we left the matter in independent hands. There is no doubt about the Corporation wanting to go the whole way. I am satisfied in my own mind that to continue with the present method is wrong, that however careful some of the operators might be in this we must not place our trust in the human element. I have watched and, without blame to the cutters, I am satisfied we should be taking no risks whatever. This machine is efficient and it should be adopted throughout the country. I state this clearly because unless the Board of Shecheta

adopts this throughout the country, and at the same time, it will not get the results required. It is the duty of the local authorities to provide accommodation for the machine which is the most efficient and it would be a wrong thing not to do so. I say that it must be universal and adopted at once. There should be no occasion for any carcase butchers to go elsewhere to slaughter. There is no intention of window dressing by the Board of Shecheta. It should be adopted throughout the country. If it is more humane it is a wrong thing entirely to continue the old method which is not as humane. I support entirely this new method, having satisfied myself in these two years. We must use a mechanically operated machine."

Mr. Hill : " Mr. Salmon, our officer, asked me to come along. I was here a year ago. I take it that this vote will simply express our opinion that this machine is more humane than the old method. My duty is to tell the Committee the opinion of the men. I have asked the men personally individually, away from each other, and they are unanimously of the opinion that this Weinberg Machine is not more humane, or as humane, as the old Jewish method. They do not think the old method is cruel other than is absolutely necessary in the slaughtering of animals. In making it less painful to the animal we must not forget the men. The opinion of the men is this—with this machine (we do not object to a machine from the labour side, we do not object to the Weinberg Machine, and I do not think you may anticipate any trouble if it is installed) while trying to lessen the pain to the animal we should not increase it for the men. We are of the opinion that the difficulty of the job of holding the head is a source of constant danger to the men—a very real difficulty. As far as the machine itself is concerned I am satisfied that if we are going to cast these animals by mechanical means you will not improve the machine. As regards the question of time there is no objection. I take it I am going to vote on whether it is more humane than the old method."

Dr. Daiches : " We are dealing with a particular machine."

Capt. Hume : " The difficulty is this, that Mr. Hayhurst fears that if adopted in one and not in all slaughterhouses the trade might be prejudiced and go away to other slaughterhouses. Is there any way of preventing this from happening other than making it compulsory throughout the country."

Dr. Daiches : " We are here to express an opinion on the machine. If our opinion is expressed clearly the ordinary course will follow. It is not a question of adopting it here or there. We express the opinion that it should be adopted. This Committee gives its report and recommends it."

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Mr. Whittingham : " I have seen these trials from the commencement. I would like to compliment Mr. Weinberg on the progress he has made with his machine. I think he has made a great advance. I do not think this Committee would be right in stating that this machine ought to be the only one in use. If the Shecheta Board adopts this machine for use for a certain time it will stop other people from inventing machines."

Prof. Gofton : " We will maintain an open mind with any other invention."

Col. Dunlop Young : " I quite agree with my friend, the Chairman of the Committee, and I wish to support it with all my strength. If this machine is going to be adopted by the Shecheta Board what power have we to say whether it is going to be in use in Islington and in other parts of the country. It should be in use in every place where the Jewish method of slaughtering is, and be compulsory. I watched very carefully a man holding down an animal's head and it seemed to me that if it is not a powerful animal the danger is not very great, but if the opposite takes place and the animal is very powerful and lifts its head there is an element of danger to the man who is holding down the head."

Capt. Hume : " Do I gather from that that in the ordinary method the head does not need to be held ? "

Col. Dunlop Young : " It does have to be held."

Mr. Hill : " The men do not object to a machine nor to the Weinberg Machine, but their opinion is that it is not more humane."

Mr. Paddison : " They all resent the idea that the old methods are inhumane. If we improve something and say it is more humane it is a reflection upon the men. They look upon it as such."

Mr. Hayhurst : " It would be a wrong thing to persist with the old method if a more humane instrument came along. I suggest we recommend it until such a time when a more humane method is invented. Our point is that this should be used throughout the country."

Major Brennan DeVine : " That is my point. We should not adopt it throughout the country because we may get something better. We are here to say whether it is the best thing we have at the present time, but we are not here to advertise Mr. Weinberg. I do not want us to be utilised as recommending something for one particular man."

Col. Dunlop Young : " In other words you go on the lines that a mechanical instrument be used but you do not recommend any special machine."

Dr. Daiches : " If a better machine comes along we shall see what we can do."

Major Brennan DeVine : " We recommend that this should replace the present method of the casting. I strongly recommend it."

Mr. Paddison : " It is best to say nothing about future improvements. If we recommend this it will go a long way to show what we are doing."

Prof. Gofton : " With regard to the possible appearance of other machines, this does not exclude consideration of other machines. We are considering one machine only. With regard to the enforcement of this throughout the country, we have no power. We can only recommend it. The only method by which it can be adopted throughout the country is an Act of Parliament. What power the Shecheta Board has in the Jewish World is beyond my knowledge, but they say they recommend and adopt it amongst their people. I submit the motion as it stands to the meeting and ask that it be put to the vote."

Ritual Aspect.

Mr. Levitta : " Mr. Chairman and Gentlemen, I have been present at every test of the Weinberg Casting Machine carried out at Islington and found the following points worthy of immediate consideration :

(1) The machine has been somewhat improved by the suggestion I made some time back, in so far that the neck of the animal is now more exposed. There is, however, room for more improvement in this direction.

(2) The machine in its present form is very inconvenient for the cutter since he is compelled to stand on the animal's left and can therefore draw tight the throat hide with his left hand only in the wrong direction ; thus experiencing difficulty in cutting.

I therefore make the following suggestions :—

To overcome the first obstacle, the pen should have a larger gradient so that still more of the neck be exposed at the opening in the front, to the cutter.

To overcome the second, the cylindrical body of the machine be made to rotate through only a quarter of a circle, thus putting the animal on its side instead of its back, and bringing the head very near the cutter. Furthermore, the roller path near the head should be moved further towards the other path ; thus permitting the cutter to stand on the right of the animal, with ample room for his left hand to draw tight the throat hide from the head downwards—an essential process for carrying out an important Shecheta regulation. This correction may bring the head of the animal considerably higher than at present. To overcome this the roller paths should be fixed flush with the ground instead of 9 inches above the ground as at present, and a slightly higher box or platform be used under the animal's head to supplement the difference incurred."

(Signed) J. LEVITTA.

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Dr. Daiches : " May I ask Mr. Levitta whether he thinks from the ritual point of view there is any objection ? "

Mr. Levitta : " No objection."

Mr. Zeitlyn : " I should like to know whether the suggested improvements are capable of being applied to this machine easily ? "

Mr. Legros : " They are covered in the recommendations made in my report."

Mr. Zeitlyn : " They will not affect the mechanism ? "

Mr. Legros : " No."

Commercial Aspect.

Prof. Gofton : " I have asked to refer to the remarks made by Mr. Hill. My experience of the men is that they are like their employers—very conservative in outlook and very slow (not intentionally) of adopting new methods. Frankly I do not see any vast difference from the holding of the head in the ordinary method : but if some of the little amendments are incorporated in the machine put on the market these objections will be met. I think we shall find, as time goes on, that the fears which are at present entertained are really less well founded than we at present think."

Resolution.

> *That this Committee is satisfied that the Weinberg Machine, as demonstrated both by the Durability Test and the Final Trial held to-day, fulfils the objects for which it is designed ; and constitutes a great improvement from a humane standpoint on existing methods of casting animals for Shecheta ; and recommends its adoption in place of present methods.*

The Resolution was seconded by Mr. Paddison and supported by Major Brennan DeVine.

The Resolution was put to the meeting and carried.

5. Vote of thanks to Mr. Hayhurst and the Markets Committee for the facilities which they have placed at the disposal of the Committee.

Prof. Hobday (Proposer) : " Nobody could have taken more trouble than Mr. Hayhurst and the Markets Committee. Without their help we could not possibly of course have had the trial, but without their co-operation we could not possibly have carried the trial to its present stage.

Sir John Moore (Seconder) : " I should like to second the proposal and to offer our sincerest thanks to Mr. Hayhurst for all the facilities he has placed in our way. Mr. Hayhurst has been very helpful with suggestions and methods in which we should conduct the trials. I therefore have very great pleasure in seconding the vote of thanks to

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Mr. Hayhurst, and to Mr. Lloyd, and all those who have been associated with Mr. Hayhurst."

Mr. Hayhurst : " Thank you very much, but all that I have done has been on behalf of my Chairman. The Markets Committee recognised they were the largest Jewish slaughtering establishment in the country, and all that I have done has been under their instructions. I am very pleased to be here to-day. Mr. Bray is present and will tell you that the Committee wished to help the Board of Shecheta."

Sir John Moore : " I think we ought really to give a special vote of thanks to Mr. Bray, the Chairman of the Cattle Markets Committee."

Mr. Bray : " I can assure you that the City Corporation are ever ready to render their help and assistance to anything which might be to the benefit of the community. I am very pleased that Mr. Hayhurst has given you the satisfaction which you have expressed. We knew he would help you in every possible way. He would desire to do that for the benefit of the community and for all concerned, and we shall be quite satisfied if you make a success of your project, if it is of advantage to the public and trade in general."

6. This Committee desires to express its keen appreciation of the action of the Board of Shecheta, who have spared no expense in order to obtain a satisfactory trial of the Weinberg Pen. They also desire to record their indebtedness to Mr. Simon Myers, the Chief Investigating Officer, for the great trouble he has taken."

Capt. Hume (Proposer) : " I have very great pleasure in proposing this vote of thanks because as we all know the Jews attach great importance to humanity. We Gentiles have learnt very much from them, and this applies to animals as well. The attitude they have taken in spending so much money in making the arrangements they have been carrying out expresses the deep feeling which permeates the Jewish community. I have great pleasure in proposing this."

Major Brennan DeVine : " I have very great pleasure in seconding the resolution put forward by Capt. Hume. I am sure that we are all greatly indebted to the Shecheta Board for what they have done in forwarding the trials of this pen and giving every facility so that we could test and come to final conclusions regarding the reliability or otherwise of this particular machine."

Vote of thanks to Professor Hobday.

Dr. Daiches : " I think it a great pleasure to move a hearty vote of thanks to Professor Hobday. I am sure it is not necessary to say many words on this pleasant subject and we all know and have learnt to admire his patience. If we had not adopted him as Chairman we might not have adopted this pen."

Mr. Paddison seconded this, which was carried with applause.

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Review

The Rat. By A. Moore Hogarth, F.E.S. Pp. 112. London: John Bale & Danielsson. Price 8/6 nett.

While dedicating the book to the Medical Officers of Health, it was evidently also the intention of the Author to write a book which would have the dual purpose of appealing to both the professional and the layman. The book covers a wide field, dealing with the very great importance of combating the rat menace from the Public Health standpoint and showing the enormous amount of destruction, which is almost unbelievable to the layman.

After reading this book, it is not too much to say, that there is probably some connection between the serious epidemics which occur throughout the world and the rat question. The author deals with the passing of the Rat Act and the efforts of the College of Pestology, which might well be extended to the teaching in Schools (particularly those in rat infected areas), of the very great seriousness of the rat menace and the proved best methods of dealing with it. A leaflet containing extracts from the book could, with great advantage, be distributed among the Senior boys.

The author gives figures of the results of various traps and poisons and it is noted that the most effective methods are also the cheapest.

The author mentions the necessity of camouflage and the battle of wits between the rat and the trapper; more stress might have been laid upon this, as it is well known that the rat is the most suspicious of animals. This fact should appeal to young sportsmen.

Of all the methods suggested for destroying rats, the best method appears to be that of trapping alive, for the simple reason that even if poisons are effective, the drawback in densely populated areas is that rats probably die in their runs; and again, the layman hesitates to use poisons. He is also more convinced of the results of his efforts when he sees his captures. Of course, there are areas where either poison, fumigation, or flooding, are most advisable.

"Stopping" method appears to be the most effective in dealing with the destruction of rats *en masse* in congested areas, and could be introduced by camouflage to entice the rodents almost anywhere.

The Rat Act, while admirable in its way, fails utterly to achieve its purpose, as long as the layman looks upon it as a red-tape round his neck, instead of as a blessing to mankind, of whom he is a member.

The best method would be to bring home to the public the seriousness of the rat menace (stopping short of a panic) and properly organised departments in each area for dealing with the campaign. This need not necessarily be a Government Department, as with a small Government subsidy, local bodies or clubs could be formed under the guidance of responsible official experts, offering trophies and prizes to those with a sporting instinct, and a price on tails to those to whom monetary consideration appeals most (this should be of special attraction to some unemployed, possessing a natural inclination for rat hunting), and to popularise the propaganda on the subject, hitherto considered obnoxious for the lecture platform.

The " Rodier " system, that of catching rats, killing the females and liberating the males, gives a result in which there becomes a preponderance of males, the females become less and less prolific and in time exterminate themselves. Although admirable from the scientific standpoint, it is not at the present day practicable, and therefore we must adopt the next best means.

The introduction of the system related by Boelter which I will term " The Dago System " (which is really the " Rodier " system, but with a " vengance," i.e. before liberating the bucks, to get them accustomed to devouring the carcases of the does, and to liberate them when they have turned 100% cannibals), may be worth the attention of a National Conference or International Congress on Deratisation, whenever such an assembly takes place.

In conclusion I would suggest to the author to issue an abridged pamphlet eliminating all scientific matter, dealing only with popular means of hunting the Rat. This would easily be read and appeal to the ordinary youth. The responsibility of the distribution of a pamphlet of this kind should be taken over by local authorities, who would order large quantities of the pamphlets and distribute them freely in their areas. This would popularise the hunt, either for sport or for gain. H. W.

Correspondence

To the Editor of THE VETERINARY JOURNAL, *London.*

Milk Fever.

SIR,—

Re Milk Fever, an account of which was given in the January issue of THE VETERINARY JOURNAL, it has been quite a common experience with me to meet cows down with milk fever some months after calving, showing all the typical symptoms of the affection. Invariably, I have found upon questioning the owner, that the animal had been in œstrum the previous day, but it did not seem to matter whether she had been served or not, with regard to incidence of the disease.

I have found that they recover much quicker from an attack such as this, than from the usual attack after calving. I have also found that such cases often get the affection after calving at some later time, though this is not invariable.

With regard to the affection, it has also been my experience that it is a fatal thing to inflate the udder with oxygen after it has been inflated with air, or even after it has been previously inflated with oxygen. In such cases the animal will die in less than ten minutes, without even making a struggle, and I wonder if this has been the experience of any other practitioner.

In connection with the calcium gluconate treatment for milk fever, I have never used it, but I would like to know if it is of any use in those obstinate cases of milk fever which do not respond to the usual method of inflation.

Yours faithfully,

GEORGE HOBSON.

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To the Editor of THE VETERINARY JOURNAL, *London.*

Aged Cow and Calves.

SIR,—

I DO not know whether you will consider the following case as worth putting on record, but I send it to you to use as you think fit.

My informant is Mr. James Nicolson, Auchoirk Farm, Tighnabruiach, Scotland. He writes in answer to a letter of inquiry :—

"I am not certain whether the old cow is 25 or in her 25th year. She calved when three years old and has had a calf every year till 1925, which year she was yeld. She calved the following January, 1926, also in January, 1927, 1928, and 1929. She has come in season regularly all summer and has been served but I don't think she is in calf as she is still suckling a calf. We have not used her milk for household purposes for the last ten years, the first five of which we hand-fed calves, but the last five she has suckled four calves in each year, two from January till May and a second pair from June till October. This year we put another one on to her at the end of October and she is making a splendid job of it. If spared we intend putting one on her when she goes to grass.

"We have never known her to miss a meal, nor have an illness of any kind. Her vessel and teats are as sound to-day as at the beginning. Her teeth are pretty well away but she enjoys potatoes and all other soft foods." (Signed) James Nicolson.

This seems to me to be a sufficiently unusual case to be worth recording.

Yours truly,

Edinburgh. GERALD LEIGHTON, M.D., F.R.S.E.

Parliamentary News

TRAINING OF VETERINARY SURGEONS.—Dr. Freemantle, on February 10th, asked the Minister of Agriculture if it was not very important for the Minister to deal with the training of veterinary surgeons. Mr. Buxton replied that the urgency of this matter was great. Arrangements were being made to deal with the reconstruction of the Royal Veterinary College by the department concerned.

Publishers' Notices

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Letters for the JOURNAL, literary contributions, reports, notices, books for review, exchanges, new instruments or materials, and all matter for publication (except advertisements) should be addressed to the Editor.

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